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EXAMINER	
KANE, JASON M.	

ART UNIT	PAPER NUMBER
4122	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/529,367	HILL ET AL.	
	Examiner	Art Unit	
	JASON KANE	4122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 March 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/28/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-24 are pending as amended on 11 August 2008.

Specification

1. The abstract of the disclosure is objected to because it contains: more than 150 words, the legal phraseology "said layers", sentence fragment starting with “The substantially exact registration is achieved by…”, and misspelled words “hat” and “profess”. Correction is required. See MPEP § 608.01(b).

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The disclosure is objected to because of the following informalities: incomplete statement, "for example the HORIBA LA-920 manufactured by..." (pg 14), reference to

Figure 4F on page 22 in the last sentence of the second paragraph, "In Figure 4F, if amended layer 120..." should be to Figure 5F, reference is made to uniform layer 16 in Figures 7G-K (pg 23, 1st paragraph), however, no such layer is indicated in the figures.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 2, 4-6, 9-12, and 16-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill et al. WO 00/46043.

6. **Regarding claims 1, 2, 9, 10, 11, and 16, 17 and 21-24,** Hill et al. disclose a method of partially imaging an imaging surface of a substrate with a plurality of layers of marking material which have at least one common boundary within a print pattern that covers only certain portions of the substrate and not other portions of the substrate (Abstract). The invention pertains to the partial imaging of a substrate with superimposed layers of marking material in the form of a print pattern with substantially exact registration (pg 1 lines 3-5). The method can be used to make vision control panels, especially glass printed with ceramic ink (pg 1 lines 5-6).

Referring to Figures 5D-F, Hill et al. disclose the transfer of decal 27 comprising layers 12, 14, 16, 38 and 36 to glass sheet 40 (pg 40 lines 11-22). Layers 12, 14 and 16

are superimposed ceramic ink layers (pg 40 lines 11-13). Ceramic ink layers 12, 14 and 16, as transferred from decal 27 onto glass sheet 40, define the print pattern on glass 40 and subsequently tempered glass 50 (Figure 5E & F, pg 40 lines 17-22). Decal 27 and glass sheet 40 are subjected to a glass tempering heat treatment burning off downcoat 38 and covercoat 36 leaving ceramic ink layers 12, 14 and 16 fused into tempered glass 50 in the required print pattern in substantially exact registration (Figure 5F, pg 40 lines 19-22). Note that parts of layer 38, burned off during the heat treatment, exist outside of the print pattern as defined by ceramic ink layers 12, 14 and 16 (Figure 5D & E). Note that burning and vaporizing constitute the same process.

Hill et al. do not explicitly disclose that ceramic ink layers 12, 14, and 16 comprise glass frit, pigment and resin matrix material and that during heat treatment glass frit melts causing the subsequent fusing/binding of the layers onto the sheet of glass within the print pattern.

Hill et al. disclose, however, that ceramic ink typically comprises glass frit, metal oxide pigments and a binding medium of solvent, resin and plasticizer (pg 8 lines 3-5). Hill et al. further disclose that after ceramic ink is applied to a normal sheet of glass, the printed glass is typically subjected to a thermal regime which burns off all components of the ceramic ink other than glass frit and pigment and melts the glass frit and fuses the remainder of the ink onto the glass (pg 8 lines 11-16).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use ceramic ink comprising glass frit, metal oxide pigments and a binding medium containing resin as taught by Hill et al. in Hill et al.'s process. The

rationale for combining is based on the teachings of Hill et al. that use of a ceramic ink comprising glass frit, metal oxide pigments and a binding medium of solvent, resin and plasticizer in the printing of glass predictably results in a ceramic ink that can be effectively printed onto to a normal sheet of glass by heat treatment via melting of the glass frit and fusing of the remainder of the ink onto the glass (pg 8 lines 3-5, 11-16).

7. **Regarding claim 4,** Hill et al. in view of Hill et al. disclose all limitations of claim 1 (see paragraph 6 above).

Hill et al. further disclose the introduction of one or more interlayers of clear glass flux or glass frit with a clear medium, typically, of solvent, resin and plasticizer noted as being essentially a clear ceramic ink without pigments (pg 29 lines 7-11). Hill et al. disclose introduction of these interlayers of clear ceramic ink as a way of separating layers of differently colored ceramic ink in order to reduce the risk of intermixing during heat treatment (pg 29 lines 7-11). Note that introducing such clear ceramic ink interlayers between the ceramic ink layers of the process described in 6 above would inherently place such layers in a position of defining the print pattern. Hill et al. further disclose that all of the methods described enable the production of dot, line and other print patterns comprising discrete elements which may be held in the desired spatial relationship (pg 29 lines 19-21).

8. **Regarding claims 5 and 18,** Hill et al. in view of Hill et al. disclose all limitations of claim 1 (see 6 above).

Hill et al. do not disclose the following: applying a preliminary heat treatment to a layer comprising glass frit and resin matrix such that the resin matrix is substantially

removed from the layer during the preliminary heat treatment; after burning off of parts of layers outside of the print pattern subjecting the sheet of glass to a glass toughening process comprising a further heat treatment process and subsequent cooling by cold air quenching.

Hill et al. disclose heat treating a printed sheet of glass in two different temperature regimes (pg 8 lines 11-21). The first temperature regime (referred to as an ink fusing regime) typically involves temperatures up to 576^{o}C which burns off all components of the ceramic ink other than glass frit and pigment and melts the glass frit and fuses the remainder of the ink onto the glass. The second temperature regime (referred to as a tempering or toughening regime) typically involves temperatures between 670^{o}C and 700^{o}C for tempering the glass followed by fast cooling, typically by cold air quenching (pg 8 lines 11-21). The tempering regime imparts a considerably improved flexural strength to the resultant tempered glass (pg 8 lines 24-27). Hill et al. further disclose that the tempering regime may be carried out after a separate ink fusing regime (pg 8 lines 28-30).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to subject the ceramic ink printed glass sheet in Hill et al. to an ink fusing regime prior to a glass tempering regime as taught by Hill et al. The rationale for combining is based on the teaching of Hill et al. that doing so will predictably result in effectively burning off all components of the ceramic ink other than glass frit and pigment and fusing the remainder of the ink onto the glass prior to tempering the glass (pg 8 lines 11-30). Further rationale for combining is based on the teaching of Hill et al.

that cold-air quenching predictably results in a fast way of cooling the glass sheet from the tempering regime facilitating the strengthening of the glass sheet (pg 8 lines 11-27).

Note that when the ink fusing regime is carried out prior to the glass tempering regime, the ink fusing regime (in which the resin matrix is burned off) constitutes a preliminary heat treatment.

9. **Regarding claim 6 and 20,** Hill et al. in view of Hill et al. disclose all limitations of claims 1 and 9 (see 6 above), however, do not explicitly disclose the migration of molten glass frit from one ceramic ink layer into another or the settling of pigment into the molten glass frit. Given that ceramic link layers 12, 14 and 16 (comprising glass frit and pigment) lie one on top of the other (Figure 5D-F), migration of molten glass frit and settling of pigment into the molten glass frit would, by definition, occur due to gravity upon melting of the glass frit in these layers during the tempering regime in which ceramic ink layers 12, 14 and 16 are fused into tempered glass 50 (pg 40 lines 19-22).

10. **Regarding claim 12,** Hill et al. in view of Hill et al. disclose all limitations of claim 11 (see 6 above) and further disclose covercoat 36, typically a methacrylate lacquer (pg 40 lines 16-17). Hill et al. do not explicitly disclose that covercoat 36 does not contain glass frit, however, covercoat 36 is burned off during the tempering heat treatment (pg 40 lines 19-22) and therefore, by definition, does not contain glass frit.

11. **Regarding claim 19,** Hill et al. in view of Hill et al. disclose all limitations of claim 1 (see 6 above).

Hill et al. do not disclose removing the parts of a layer outside of the print pattern by a subsequent finishing process comprising applying a vacuum, water jetting or air jetting.

Hill et al. disclose a method 3.2 (pg 22 line 21 to pg 23 line 6) of partially imaging a substrate with superimposed layers whereby unwanted ink between the selectively applied adhesive (marking the desired print pattern) can be removed by a number of methods including air jetting or water jetting.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to remove unwanted ink outside of a print pattern using air jetting or water jetting as taught by Hill et al. in Hill et al.'s process. The rationale for combining is based on the teaching of Hill et al. that doing so will predictably result in an effective way of removing unwanted ink outside of the print pattern (pg 22 line 31 to pg 23 line 6).

12. Claims 3, 14 & 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill et al. WO 00/46043 as applied to claims 1, 2, 4-6, 9-12, 16-24 above, and further in view of Whitehead US Patent 4,321,778.

13. **Regarding claims 3, 14 and 15,** Hill et al. in view of Hill et al. disclose all limitations of claim 1 (see paragraph 6 above).

Hill et al. do not disclose the following: a plurality of single layers of different color having spaced apart boundaries; a print pattern defined by white ceramic ink comprising glass frit and resin matrix material; and a print pattern defined by black ceramic ink comprising glass frit and resin matrix material.

Whitehead discloses a glass pane whereby a broken pattern of white and black opaque material is applied to the surface or surfaces of the glass pane (Abstract). The pattern can be formed by dots, lines or any suitable shapes made up of white and black opaque material (Column 2, lines 10-12). Single layer dots of black and white opaque material defining a print pattern on opposite sides of a glass pane are illustrated in Figures 1B, C and I (Column 2, lines 14-20). According to one embodiment, the black and white opaque material is ceramic ink applied to the glass surface by either silk-screening or a decal method (Column 2, lines 43-46). Whitehead further discloses use of such a glass pane to allow persons on one side of the pane to see through to the other side without undue loss of clarity while persons on the other side are not unduly distracted by reflections from the pane and movement of the persons on the other side (Column 1 lines 7-23).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to print single layers of black and white ceramic ink dots defining a print pattern on opposite sides of a glass pane as taught by Whitehead in Hill et al.'s process. The rationale to combine is based on the teachings of Whitehead that a such a method of printing a glass pane will predictably result in a glass pane that will allow persons on one side of the pane to see through to the other side without undue loss of clarity while persons on the other side are not unduly distracted by reflections from the pane and movement of the persons on the other side (Column 1 lines 7-23).

14. Claims 7, 8 & 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill et al. WO 00/46043 as applied to claims 1-6, 9-12 & 14-24 above, and in view of Yamano et al. US Patent 4,971,858.

15. **Regarding claims 7 and 8,** Hill et al. in view of Hill et al. disclose all limitations of claims 1 and 11 (see 6 above).

Hill et al. do not disclose the melting of resin during the heat treatment process to form liquid resin.

Yamano et al. disclose a method for forming and fixing a pattern onto a substrate in which the pattern is formed using a sheet (Abstract). The pattern-forming sheets are disclosed as being useful for preparation of a design for a figure to be formed on porcelain, glassware, enameled articles and the like or for formation of patterns for bar code labels on substrates of ceramics or other heat-resistant materials (Column 6 lines 16-23). The ink used for the pattern-forming sheets is disclosed as comprising glass frit and inorganic pigment, metallic powder, metallic oxide powder or the like (Column 4 lines 41-45). Yamano et al. further disclose that the ink preferably contains an organic binder and/or wax including polyamide resins, petroleum resins, styrene resins, paraffin wax and carnauba wax (Column 5 lines 17-22).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a resin binding matrix comprising paraffin wax and/or carnauba wax as taught by Yamano et al. in the ceramic ink in Hill et al.'s process. The rationale to combine is based on the teaching of Yamano et al. that use of such binders in

ceramic ink will predictably result in an ink useful for pattern-forming (Column 5 lines 17-22).

Since carnauba wax and paraffin wax both have melting points above room temperature, heating of a ceramic ink printed glass surface where the ink contained one or both of these resin matrix materials will, by definition, result in melting of the resin matrix to form liquid resin before subsequent burning off of the resinous material as the temperature increases. The liquid resin produced during heating and prior to burning off will, by definition, carry particles of glass frit from the uppers layers of ceramic ink to the lower layers of ceramic ink due to gravity.

16. **Regarding claim 13,** Hill et al. in view of Hill et al. disclose all limitations of claims 1 & 11 (see paragraph 6 above).

Hill et al. do not disclose the burning off of matrix leaving pigment on the sheet of glass outside of the print pattern.

Yamano et al. disclose a method for forming and fixing a pattern onto a substrate in which the pattern is formed using a sheet (Abstract). The pattern-forming sheets are disclosed as being useful for preparation of a design for a figure to be formed on porcelain, glassware, enameled articles and the like or for formation of patterns for bar code labels on substrates of ceramics or other heat-resistant materials (Column 6 lines 16-23). In Example 4 (Column 10 lines 20 to page bottom), Yamano et al. disclose the printing of a bar code pattern onto the surface of a glass product. The pattern design 5 is defined by black ceramic ink comprising frit and binder (Figure 4 & Table 2) on a white ceramic ink background comprising frit and binder, referred to as an ink-receiving

layer 9 (Figure 4 & Table 1). Both the design layer 5 and ink-receiving layer 9 are transferred from the sheet illustrated in Figure 4 onto the glass sheet via adhesive layer 11 after removing second releasable substrate 13 and then subjected to heat treatment (Column 10 lines 20 to page bottom). During heat treatment the adhesive and resin binder are completely burned off leaving a black bar code pattern on a white background, the white background existing outside of the print pattern defined by the black ink. Yamano et al. further disclose that the black bar code pattern is firmly held on the white substrate with clear contrast (Column 10 lines 64 to page bottom).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the method of burning off binder matrix leaving white pigment on a sheet of glass outside of a print pattern defined by black pigment as taught by Yamano et al in Hill et al.'s process. The rationale for combining is based on the teaching of Yamano et al. that doing so will predictably result in a black bar code pattern firmly held onto a white substrate with clear contrast (Column 10 lines 64 to page bottom).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON KANE whose telephone number is (571)270-7659. The examiner can normally be reached on M-R 6:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on (571)272-1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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